CONVERGENT TECHNOLOGIES

HARDWARE

MiniFrame *Plus*™ Overview

- Powerful 16-/32-bit super microcomputer supporting up to 16 users

- Industry standard UNIX™ System V Release 2 with 4 MB demand-paged virtual memory

- High performance Motorola 68010 microprocessor operates at 10 MHz with no wait states

- 512 KB RAM expandable to 2 MB in 512 KB increments

- Object-code compatible with the MegaFrame™ system family

- System backup via ¼-inch streaming tape and/or 5¼-inch floppy

- Up to two integral 5¼-inch, 26 or 50 MB Winchester disk drives

- Multidrop RS-422 port at 307 Kbit/second

- Two RS-232 ports at up to 9.6 Kbit/second

- Centronics-compatible parallel printer port

- Expansion slot for optional communication module:
  — Eight RS-232 port module
  — Sixteen RS-232 ports and one multidrop RS-422 port module
  — Ethernet module
  — Ethernet module with eight RS-232 ports

- Programming languages include industry standard High Level COBOL, BASIC, FORTRAN 77, Pascal, and "C"

- Data management facilities include ISAM, Sort/Merge, and a Forms generation package

- Communications include BSC 3270 Terminal Emulator, BSC 2780/3780 RJE, SNA 3270 Emulator, X.25, and TCP/IP via Ethernet

- Development tools include the Source Code Control System and full screen program Editor, Linker, and Debugger

- Office Automation includes Word Processor, Financial Spreadsheet, Electronic Mail, and Business Graphics libraries

- Window Manager supports a multi-window, multi-application environment for PT and GT terminals

The Convergent Technologies MiniFrame *Plus*™ is a high performance 16-/32-bit super-microcomputer designed to provide low-cost solutions for vertical applications in both commercial and office environments. The foundation of this system is a powerful Motorola 68010 CPU. Combined with an efficient discrete Memory Management Unit, this system provides high speed RAM access and a large virtual memory address space for superior performance in supporting up to 16 users concurrently.

The MiniFrame *Plus* computer system incorporates the industry standard UNIX™ System V Release 2 Operating System to address the expanding multi-user UNIX marketplace. This allows Convergent to offer extensive programming tools and languages for the development of unique applications while being fully compatible with thousands of existing third-party software packages.

The system will support two 5¼-inch Winchester disks (formatted capacities in parentheses) with capacities of 50 MB (37 MB) and/or 26 MB (21 MB). Backup support includes a choice of either a 55 MB ¼-inch streaming tape, a 5¼-inch 1 MB (640 KB) floppy disk, or both.

An on-board multidrop RS-422 port can run up to 8 Convergent PT™ or GT™ terminals at 307 Kbit/second. Two RS-232 lines can support synchronous and asynchronous protocols at speeds up to 9.6 Kbit/second. A Centronics-compatible parallel printer port supporting speeds up to 600 lines per minute is also provided.

Memory Expansion

Memory Expansion boards provide expansion in 512 KB increments. One expansion board comes as part of all standard configurations having a ¼-inch tape device; additional expansion boards can be added up to a system total of 2 MB of RAM.

Communications Expansion

The MiniFrame *Plus* provides one expansion slot for adding any one of several optional communication modules.

An **Ethernet expansion** module provides communications to other MiniFrame or MegaFrame systems and is compatible with IEEE 802.3 LAN standard.

An **8-port RS-232 expansion** module with full modem control will support standard ASCII terminals and serial printers at speeds up to 9.6 Kbit/second. An alternative module combines the **8 RS-232 ports with Ethernet** communications.

A **16-port RS-232 expansion** module with full modem control is also available, supporting standard ASCII terminals and serial printers at up to 9.6 Kbit/second.

Alternatively, a customer-designed communication module with a DMA system interface may be added. Up to 105 square inches are available along with 5 amps at 5 volts power.
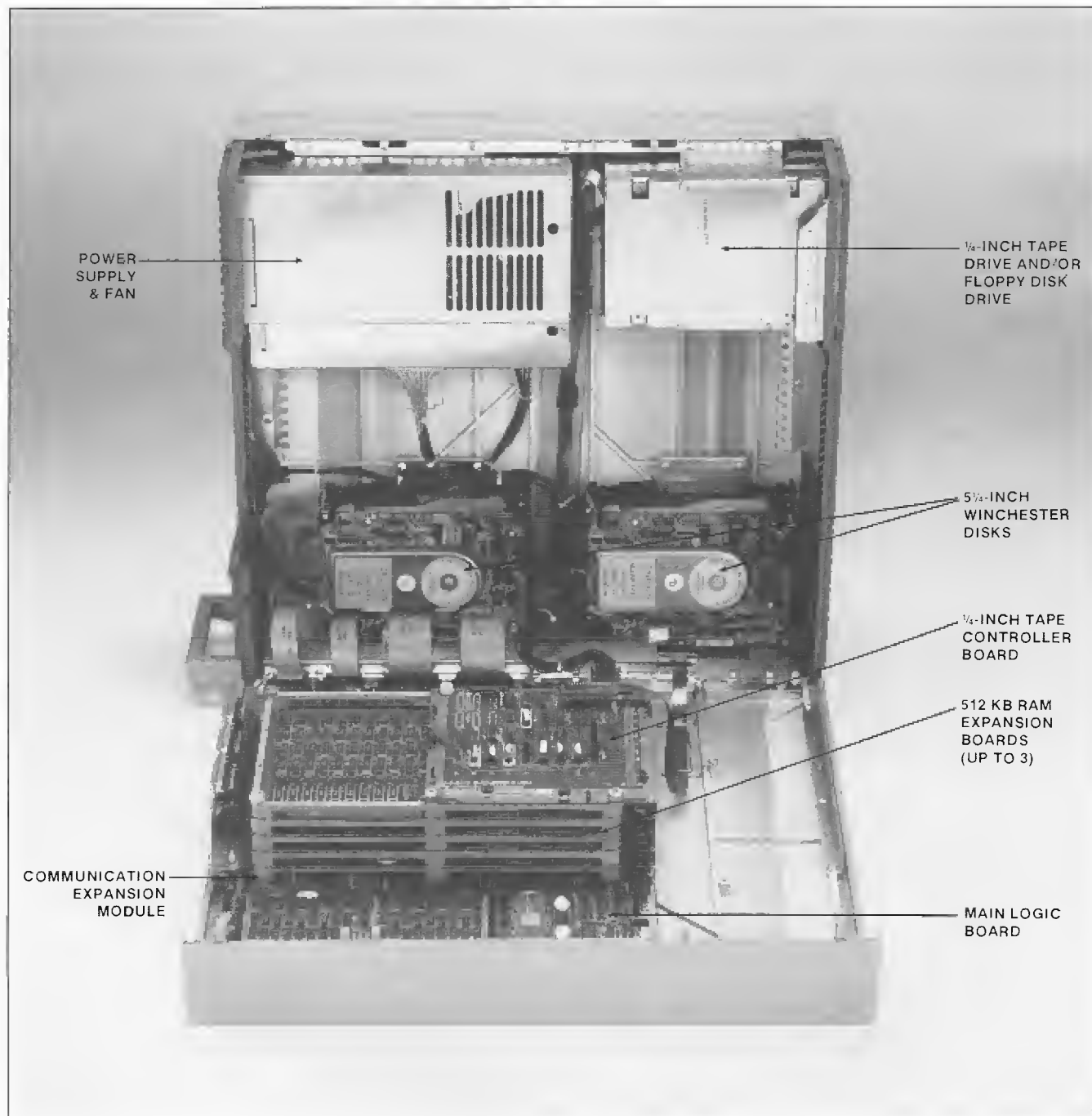
OPERATING SYSTEM SUPPORT

The CTIX™ Operating System is a time-shared operating system for the Convergent MiniFrame *Plus* and MegaFrame systems, based on UNIX System V Release 2. It provides a reliable high-performance base around which to build time-shared, interactive applications.

Virtual Memory

By using proprietary virtual memory hardware, Convergent has implemented a demand-paged virtual memory system while remaining totally compatible with UNIX System V Release 2.

The discrete Memory Management Unit (MMU) provides a high-speed (no wait states), demand paging scheme. Each user is provided with a uniform 3.0 MB of virtual address space which permits running programs far larger than the amount of physical memory in the system.

For maximum flexibility, the MiniFrame *Plus* system offers several entry points. This allows the price-conscious user the opportunity to profit from the MiniFrame's low cost and high performance, while retaining a path of graceful expandability as needs change.

Users may start with a high capacity 16-user system or any of several entry-level configurations. When needs change, the user may add additional terminals, select from a wide range of communications modules, or add applications from an extensive list of software packages. Since flexibility is a major objective of the MiniFrame *Plus*, much thought was given to its design so that configuration changes may be easily accomplished on site, in a matter of minutes.

As users' needs continue to change, MiniFrame *Plus* systems may be linked to members of the MiniFrame™ and MegaFrame™ family; object-code compatibility between the products insures that software investments maintain their value.

These features provide a wide range of attractive solutions for facing ever-expanding needs in an orderly and economical manner.

PROCESSING ELEMENTS

Processor

The system contains a Motorola 68010 CPU, operating at 10 MHz with no wait states. A discrete Memory Management Unit supports demand paging, and up to 2 MB of RAM.

The Memory Management Unit (MMU) provides a high-speed (no wait states), demand paging scheme with 3.0 MB of virtual address space per user. Page size is 4 KB.

POWER SUPPLY & FAN

¼-INCH TAPE DRIVE AND/OR FLOPPY DISK DRIVE

5¼-INCH WINCHESTER DISKS

¼-INCH TAPE CONTROLLER BOARD

512 KB RAM EXPANSION BOARDS (UP TO 3)

COMMUNICATION EXPANSION MODULE

MAIN LOGIC BOARD

Window Manager

The window manager provides the PT and GT terminals with a multi-window, multi-application environment in which a user may view and manipulate up to four concurrently executing applications on the same PT or GT terminal screen. The terminal maintains a 28 line virtual screen for each of the four windows. Each window can be independently scrolled horizontally and vertically. Users can also have multiple views of the same application wherein a different part of the same document can occupy a separate window with each window capable of scrolling horizontally and vertically independently.

The window manager allows users to run existing UNIX applications within a window, and permits copying and moving Financial Spreadsheets, Word Processor documents, and Electronic Mail between windows using a simple set of commands.

Command Interpreters

In addition to the *Bourne Shell,* the *Berkeley C-Shell* is provided for system programmers already familiar with the UNIX Operating System.

SOFTWARE

Convergent Technologies CTIX, a commercial implementation of UNIX System V Release 2, provides an ideal environment for distributed data processing and office automation. Available software includes a variety of programming languages, data management facilities, communication packages, and office processing tools.

Languages

CTIX-based language processors include a BASIC interpreter and compiler, FORTRAN compiler, Pascal compiler, COBOL interpreter and compiler, and C language compiler.

BASIC INTERPRETER
- Conforms to the ANSI X3.60-78 standard
- GSA certified
- Extensive screen formatting capability with the PRINT USING command
- Access to external subprograms written in C and assembler
- Access to ISAM, Sort/Merge, and the Forms Facility

BASIC COMPILER
- Compatible with BASIC interpreter
- Provides high performance application execution

FORTRAN COMPILER
- Full FORTRAN 77 ANSI X3.9-78
- GSA certified
- 3.0 MB virtual address space per user
- Extensive error messages
- Data Types:
  INTEGER*1,2,4
  REAL*4,8
  COMPLEX
  LOGICAL*1,2,4
  CHARACTER
- Cross reference listing
- IEEE standard representation of REAL data
- FORTRAN Symbolic Debugger

PASCAL COMPILER
- General conformance to ISO 1980 draft standard
- 3.0 MB virtual address space per user
- Extensive error messages
- IEEE standard representation of floating point data
- Pascal Symbolic Debugger

COBOL COMPILER
- ANSI X3.23 1974
- GSA High certified
- Screen handling facilities
- Symbolic Debugging utility available
- Uses CTIX ISAM for high performance structured file access

C COMPILER
- Conforms to "The C Programming Language" — Kernighan/Ritchie 1978

Data Management Facilities

ISAM
- Multi-user/multi-key access to structured information
- Support for six different key types:
  - byte string
  - character string
  - packed decimal
  - binary
  - long real
  - short real
- Support for transactions with record locks and queueing
- Increased flexibility through
  - duplicate keys
  - index in ascending or descending order
  - suppression of indexing on null value key fields (user selectable)

FORMS GENERATOR
- Takes full advantage of the PT and GT terminal capabilities
- Interactive design and test of sophisticated business and graphic forms
- Protected and unprotected text and graphic rulings
- Application control of run-time sequencing between fields and specification of data validation routines
- Forms run-time modules are called from application programs

SORT/MERGE
- Supports variable-length and fixed-length records
- Handles multi-level sorts up to 15 levels
- Support for six different key types:
  - byte string
  - character string
  - packed decimal
  - binary
  - long real
  - short real
- Procedural interface from application programs

Communications Services

The MiniFrame supports:
- BSC 3270 Emulator
- 2780/3780
- BSC RJE System Service
- SNA 3270 System Service
- X.25 Communications Manager System Service
- TCP/IP via Ethernet

The MiniFrame Office System

The Office Systems package is accessible via the Convergent PT and GT terminals. It consists of:

- Word Processor: a Wang-style document preparation system
- Financial Spreadsheet Package: a sophisticated financial modeling and planning software package, based on Supercomp Twenty™
- Electronic Mail Facility: an easy to use system allowing users to prepare and send electronic mail messages
- GKS graphics libraries: The Visual GKS™ and Visual C-Chart™ packages use device independent resolution algorithms to produce graphic images and fonts on the GT terminal and the Imagen® laser printer, as well as other graphics output devices. A GT Font Designer is also available.

PERIPHERAL HARDWARE

PT and GT Terminal Support

The MiniFrame Office System Package provides a multi-window, multi-application environment for PT and GT terminals in which a user may view and manipulate multiple applications on the same screen.

SPECIFICATIONS

Memory Capacity

RAM: 512 KB to 2 MB, Maximum

Serial I/O Rates

External Clock: RS-232-C: 110 Baud to 19.2 KBaud
Internal Clock: RS-232-C: 50 Baud to 19.2 KBaud
RS-422: 100 Baud to 1.8 MBaud

Parallel I/O Rate (Printer Interface)

Programmed I/O: 9600 Characters/second (typical)

Ethernet

Conforms to IEEE 802.3 specifications

Electrical

115 V: 85-130 Vrms, 4.2 Amps @ 47 Hz to 63 Hz
230 V: 180-260 Vrms, 2.1 Amps @ 47 Hz to 63 Hz

The AC loads specified above represent the loads presented to the line by a fully configured system.

PHYSICAL

Height: 22.5 in. (57.15 cm)
Width: 7.0 in. (17.78 cm), 10.0 in. (25.40 cm) including base
Depth: 23.0 in. (58.42 cm) excluding standoff at rear
Weight: 65 lbs. (29.9 Kg)

ENVIRONMENTAL AND SAFETY

Safety

Meets UL 478 (EDP) and 114 (Office Equipment)
Meets CSA 154 (EDP) and 143 (Office Equipment)
Meets VDE 080618.81 (Office Equipment)
Meets IEC 380 (Office Equipment)

Emissions

Meets VDE 8071/6.78, Level A
Meets FCC Part 15, Sub-Part J for Class A Emissions, Class B Emissions Optional

ESD:

5,000 Volts: No observable effect
15,000 Volts: No operator perceived errors
25,000 Volts: No permanent damage

Altitude:

Operating: 10,000 feet ASL
Non-Operating: 30,000 feet ASL

Acoustic Noise Level

55 dBA

Ambient Temperature

Operating: 10°C to 40°C
Non-Operating: −40°C to 60°C

Relative Humidity

Operating: 10% to 80% RH, non-condensing
Non-Operating: 10% to 80% RH, non-condensing

Shock

Operating: 5 g
Non-Operating: 15 g

Transportation

Packaging and shipping containers and procedures comply with the current NSTA preship test procedures.

Shipping container: 33 in. (h) x 32 in. (l) x 15 in. (w)